

AD-A090 718

SOUTHWEST RESEARCH INST SAN ANTONIO TEX F/6 14/2  
NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1979.(U)  
SEP 80 R T SMITH DLA900-79-C-1266  
SWRI-15-5607 NL

UNCLASSIFIED

Page 1  
AD-A090 718


END  
DATE  
FILMED  
11-80  
DTIC

1.0

2.8

2.5

3.2

2.2

3.6

2.0

4.0

1.8

1.1

1.8

1.25

1.4

1.6

U.S. GOVERNMENT PRINTING OFFICE  
1964 O - 348-000

SwRI Report 15-5607

NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1979

Southwest Research Institute  
6220 Culebra Road  
San Antonio, Texas 78284

**LEVEL II**

September 1980

Contract Number DLA900-79-C-1266  
Annual Technical Report for Period  
15 February 1979 — 15 February 1980

**DTIC**  
**ELECTE**  
OCT 23 1980  
**S** **D**  
**E**

Prepared for  
DEFENSE LOGISTICS AGENCY  
Headquarters  
Cameron Station  
Alexandria, Virginia 22314

**DISTRIBUTION STATEMENT A**  
Approved for public release  
Distribution Unlimited

ARMY MATERIALS AND MECHANICS RESEARCH CENTER  
Watertown, Massachusetts 02172

80 10 20 113

AD A090718

DDC FILE COPY

The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

Mention of any trade names or manufacturers in this report shall not be construed as advertising nor as an official endorsement or approval of such products or companies by the United States Government.

#### DISPOSITION INSTRUCTIONS

Destroy this report when it is no longer needed.  
Do not return it to the originator.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A090 118	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Nondestructive Testing Information Analysis Center, 1979.		5. TYPE OF REPORT & PERIOD COVERED Annual Technical Report. 15 Feb. 1979 — 15 Feb. 1980
7. AUTHOR(s) Richard T./Smith		6. PERFORMING ORG. REPORT NUMBER 1413W11-15-5607
9. PERFORMING ORGANIZATION NAME AND ADDRESSES Southwest Research Institute 6220 Culebra, Box 28510, San Antonio, TX 78284		8. CONTRACT OR GRANT NUMBER(s) 15 DLA980-79-C-1266
11. CONTROLLING OFFICE NAME AND ADDRESS Defense Logistics Agency Headquarters Cameron Station Alexandria, VA 22314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 12131
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Army Materials and Mechanics Research Center Watertown, MA 02172		12. REPORT DATE 17 September 1980
		13. NUMBER OF PAGES 28
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Information analysis centers Information retrieval Information systems Data bases Nondestructive testing Nondestructive evaluation		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  (see reverse side)		

DD FORM 1473  
1 JAN 73

EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

328200

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

During the reporting period, NTIAC's computerized data file grew to 17,546 records. The NTIAC Newsletter was distributed to over 4000 recipients. Ninety inquiries (technical, bibliographic, and general) were responded to.

Publications included the NTIAC Handbook and a state-of-the-art survey on Barkhausen NDE. Drafts of a critical review on magnetic leakage methods and a state-of-the-art survey on optical technologies have been prepared. Also, a critical review on accreditation and certification has been drafted, and two state-of-the-art surveys on composite materials were initiated.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SwRI Report 15-5607

NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1979

Southwest Research Institute  
6220 Culebra Road  
San Antonio, Texas 78284

September 1980

Contract Number DLA900-79-C-1266  
Annual Technical Report for Period  
15 February 1979 - 15 February 1980

Prepared for  
DEFENSE LOGISTICS AGENCY  
Headquarters  
Cameron Station  
Alexandria, Virginia 22314

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DDC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist.	Avail and/or special
A	

ARMY MATERIALS AND MECHANICS RESEARCH CENTER  
Watertown, Massachusetts 02172

APPROVED

*John R. Barton*

John R. Barton, Vice President  
Instrumentation Research Division

## TABLE OF CONTENTS

	<u>Page</u>
LIST OF FIGURES	iii
LIST OF TABLES	iv
I. INTRODUCTION	1
II. OPERATIONAL REPORT	7
A. Introduction	7
B. Information Support System (ISS)	7
C. Current Awareness and Promotional Activities	13
D. Inquiries	17
E. Technical Publications	17
F. Special Services	20
III. FUTURE PLANS	20
A. Current Awareness and Promotional Activities	20
B. Products and Services	20
IV. APPENDIX A - Contract Status Report (DSAH Forms 1261)	21



## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	NTIAC Organization and Staffing	4
2	Southwest Research Institute Organization	5
3	DTIC Support of NTIAC	6
4	Fields Comprising Input Records	11

# LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Major Current Methods of Nondestructive Testing	2
2	NTIAC Core Journals and Secondary Serial Publications	8
3	Status of NTIAC Bibliographic Data Base	12
4	1979 Newsletter Circulation	14
5	Current Awareness and Promotional Meetings	16
6	Technical and Bibliographic Inquiries	18
7	1979 Publication Sales	17

## I. INTRODUCTION

On January 6, 1976, by amendment of contract DSA900-74-C-5268, the Department of Defense transferred to Southwest Research Institute full responsibility for operation of the Nondestructive Testing Information Analysis Center (NTIAC), and discontinued the Nondestructive Testing Data Support Center (NTDSC) as a separate function.

From its establishment in 1961, through 1975, NTIAC was operated by the U.S. Army Materials and Mechanics Research Center, Watertown, Massachusetts. In February, 1974, the Department of Defense supplemented the capabilities of NTIAC through a contractor operated support function designated as the Nondestructive Testing Data Support Center (NTDSC). AMMRC continued, however, to bear responsibility as the officially designated DoD information analysis center in the field of nondestructive testing. Accordingly, AMMRC was charged to provide the interface with the NDT community for services of both NTIAC and NTDSC. During the period from February, 1974, to January, 1976, AMMRC worked closely with NTDSC to develop the latter's capability to function independently as a full service information analysis center of technical excellence. A strong relationship between AMMRC and the now fully contractor operated NTIAC continues with AMMRC being designated as the contracting officer's technical representative responsible for technically monitoring NTIAC activities.

Other major provisions of the contract remain substantially unchanged. Southwest Research Institute is charged to operate NTIAC as a full service information analysis center of technical excellence, which includes principally: establishing and continuously maintaining an information support system that is comprehensive and current with respect to the field of nondestructive testing; responding to inquiries for technical or bibliographic information; publication of a current awareness periodical (the NTIAC Newsletter); and, in response to needs of the user community, preparation, publication, and marketing of timely, authoritative critical reviews, technology assessments, state-of-the-art surveys, data books, and handbooks.

In common with other DoD IAC's, NTIAC is required to establish and maintain a service charge system for its products and services with the goal of achieving an annual rate of reimbursement equal to at least 50 percent of yearly direct funding.

The technical scope of NTIAC is that of the entire field of nondestructive testing, inspection, and evaluation--the full range of methods and techniques whereby a material, component, or entire system can be so characterized as to reliably predict its performance under a prescribed service regime. Table 1 indicates major current methods of nondestructive testing.

Table 1

## Major Current Methods of Nondestructive Testing

## . RADIOGRAPHIC AND RADIOMETRIC TESTING

X-rays  
Gamma rays  
Neutrons  
Filmless techniques

## . ELECTROMAGNETIC TESTING

Eddy Currents  
RF fields  
Microwaves  
Magnetic flux analysis  
Magnetic particles

## . ULTRASONIC AND ACOUSTIC TESTING

Ultrasonic transmission and reflectometry  
Ultrasonic imaging  
Spectrum analysis  
Acoustic emission

## . LIQUID PENETRANT TESTING

Dye penetrants  
Fluorescent penetrants

## . OPTICAL TESTING

Visual testing  
Optical reflectometry and transmission  
Holography

## . THERMAL TESTING

Infrared radiometry  
Thermography

The present organization and personnel of NTIAC are shown in Figure 1. By design, NTIAC is supported by the full resources of its host organization, Southwest Research Institute, the organizational chart of which is shown in Figure 2. Of the total Institute staff of 1800, approximately 200 professional staff constitute the resource of knowledge and expertise which can directly support NTIAC in its publications and information support systems.

In an important respect NTIAC is unique among DoD IAC's. It is the first IAC which was planned from the beginning to rely upon the Defense Technical Information Center for automatic data processing (computer) services, as well as certain other essential support services. These are indicated in Figure 3.

In Chapter II the state of development of NTIAC's basic performance areas are summarized. In Chapter III, plans and projections for the seventh year of operation are presented. The Appendices include statistical summaries, DSAH Form 1261, for the fourth quarter and cumulative summary, of the sixth contract year.

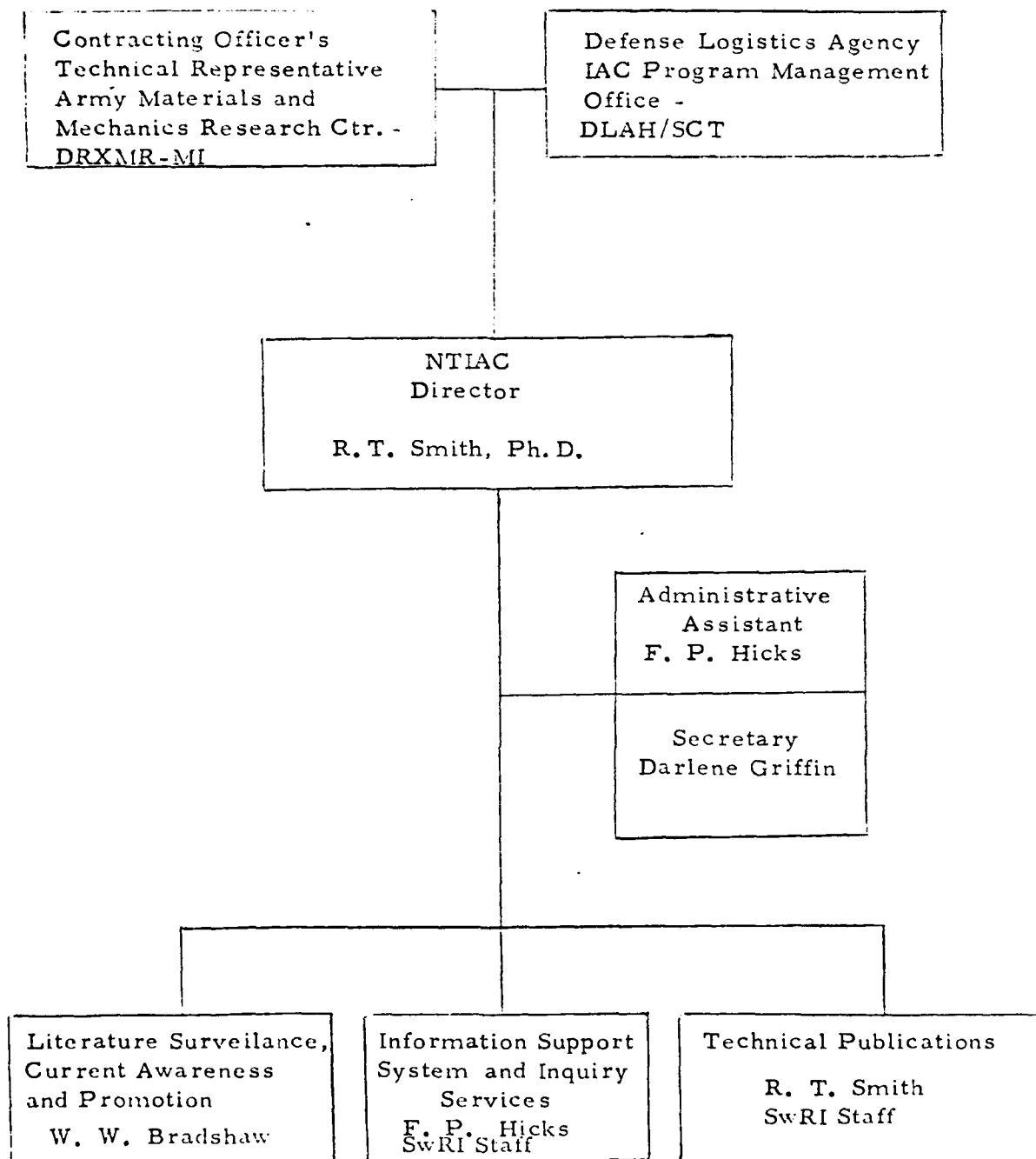
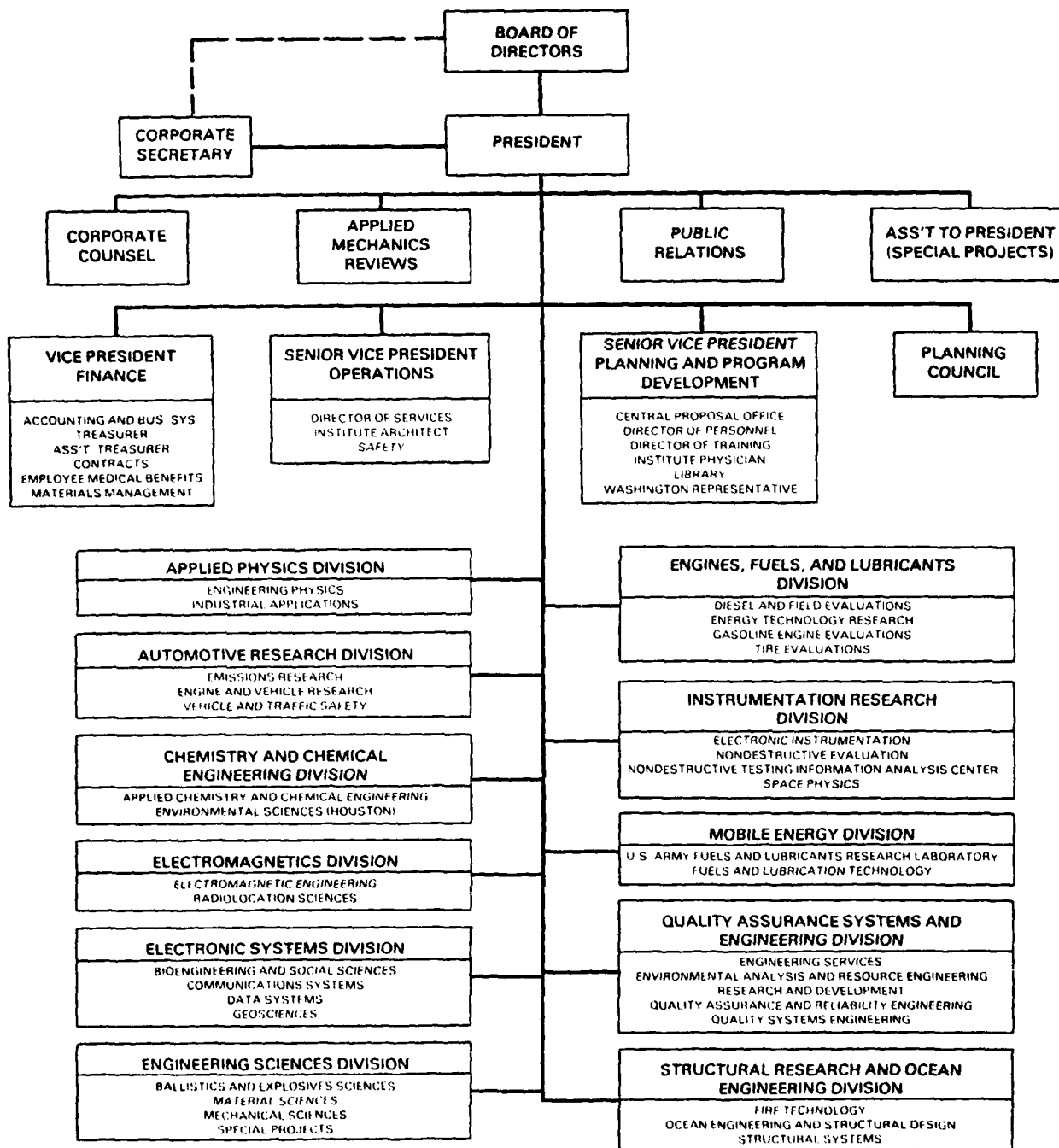


Figure 1

NTLAC Organization and Staffing

# SOUTHWEST RESEARCH INSTITUTE ORGANIZATION CHART



## STANDING COMMITTEES

ARCHITECTURAL COMMITTEE  
SERVICES COMMITTEE  
COMPUTER COMMITTEE  
ENERGY CONSERVATION COUNCIL  
LIBRARY COMMITTEE  
MANAGEMENT ADVISORY COMMITTEE  
NUCLEAR QUALITY ASSURANCE COMMITTEE  
PATENT COMMITTEE  
PLANNING COUNCIL

RADIOLOGICAL HEALTH & SAFETY COMMITTEE  
REVIEW COMMITTEE ON THE USE OF HUMAN SUBJECTS  
SAFETY COMMITTEE  
FF & L COMMITTEE  
TRANSPORTATION SAFETY RESEARCH COMMITTEE  
STRUCTURAL LIFETIME ASSURANCE COMMITTEE

— DIRECTION  
- - - COORDINATION  
REVISED FEBRUARY 1979

Figure 2

DTIC  
SUPPORT OF  
NTIAC

- . RDT&E On-Line System Terminal
- . TR-File; WU-File; R&DPP-File
- . Unique NTIAC File & Inverted (Index) File
- . Batch Input Service
- . Off-Line Print-Out Service
- . Special Output Format
- . Hard Copy Print-Out and Indices of NTIAC File
- . Selected Dissemination of Information Program

Figure 3



## II. OPERATIONAL REPORT

### A. Introduction

The major areas of NTIAC's activity are: the information support system; current awareness and promotional activities; technical and bibliographic inquiries; technical publications; and special services. The status of each of these areas is reviewed in this chapter.

### B. Information Support System (ISS)

NTIAC's ISS comprises a document collection and computerized bibliographic data files. These are kept current through systematic surveillance of the worldwide literature in nondestructive testing and closely allied technical areas.

Surveillance of open literature is accomplished in two basic modes. The most important serial literature, books, conference proceedings, etc., is directly scanned. The "core" literature comprises those serials of which a significant fraction of the contents is ordinarily accessioned. The secondary literature comprises those serials which are also directly reviewed cover to cover, but from which only selected pertinent articles are accessioned. Table 2 lists the current core and secondary serials. As an added check on our surveillance effectiveness, we also scan Current Contents, NASA/SCAN, and the monthly Engineering Index and Science Abstracts. New books, conference proceedings, etc., are surveiled through informal channels, publishers' advertisements and catalogues, and reviews published elsewhere. It is noteworthy that all serial publications, books, proceedings, etc., are furnished to NTIAC by its host institution, Southwest Research Institute, through the Institute's Library, without direct charge. (Exceptions are specific purchases made especially for NTIAC; such items become the property of NTIAC, i.e., of the U.S. Government).

Surveillance of Department of Defense technical reports is accomplished by direct receipt of reports (where NTIAC has been placed on the primary distribution list) and the current awareness service provided by the Defense Documentation Center. A copy (in either ink print or microfiche) of each accessioned report is added to the NTIAC document collection.

Other U.S. Government reports and unpublished private sector reports are surveiled mainly by requesting copies through informal contacts with agencies and individuals engaged in nondestructive testing programs. Additionally, commercially available "dial up" bibliographic data files (mainly the NTIS file) are periodically searched for NDE related citations. This gives good coverage of publicly released U. S. Government reports, especially those of NASA, which are comparatively rich in the area of NDE.

Southwest Research Institute utilizes a General Electric "Terminet 30" data communications terminal with remote batch print-out capability. This terminal is shared by the SwRI Library and NTIAC and is located in the NTIAC offices along with the DDC terminal and printer, making the overall operation convenient and efficacious. The use of this equipment for broader periodic searches of commercially available computerized data bases further ensures the adequacy of NTIAC's surveillance of the literature.

Table 2

## NTIAC CORE JOURNALS

1. Acoustical Imaging and Holography: An International Interdisciplinary Journal (USA)
2. British Journal of Non-Destructive Testing (GB)
3. Institute of Electronics and Electrical Engineers, Transactions Acoustics, Speech, and Signal Processing (USA)
4. Institute of Electronics and Electrical Engineers, Transactions Instrumentation and Measurement (USA)
5. Institute of Electronics and Electrical Engineers, Transactions Sonics and Ultrasonics (USA)
6. Journal of the Acoustical Society of America (USA)
7. Journal of Testing and Evaluation (USA)
8. Materialprüfung (Ger.)
9. Non-Destructive Testing International (GB)
10. Soviet Journal of Nondestructive Testing (USSR)
11. Materials Evaluation (USA)
12. Ultrasonics (GB)

SECONDARY SERIAL PUBLICATIONS  
SURVEILLED AND REVIEWED BY NTIAC

1. ASEA Journal (Sweden)
2. ASTM Standardization News (USA)
3. Acustica (Ger.)
4. Aircraft Engineering (GB)
5. American Ceramic Society Bulletin (USA)
6. American Laboratory (USA)
7. Journal of Engineering for Power, Transactions of ASME (USA)
8. Journal of Engineering Materials and Technology, ASME (USA)
9. Journal of Applied Mechanics, Transactions of ASME (USA)
10. Journal of Pressure Vessel Technology of ASME (USA)
11. Applied Optics (USA)
12. Applied Optics (USA)
13. Automated Control & Computer Sciences (USSR)
14. The Bell System Technical Journal (USA)
15. Canadian Aeronautics and Space Institute Transactions (Canada)
16. Composites (GB)
17. Control Engineering (USA)
18. Defense Management Journal (USA)
19. Electro-Optical Systems Design (USA)
20. Electro-Mechanical Design (USA)
21. Electronic Engineering (GB)
22. Engineering Fracture Mechanics (USA)
23. Engineering Index (USA)
24. European Scientific Notes (GB, ONR)
25. Experimental Mechanics (USA)
26. IEEE Transactions on Instrumentation and Control (USA)
27. Industrial Laboratory (USSR)
28. Industrial Research (USA)
29. Industrial Electronics and Control Instrumentation IEEE (USA)
30. Instruments and Experimental Techniques (USSR)
31. International Journal of Fracture (Netherlands)
32. Materials Science and Engineering (Switzerland)
33. Measurement Techniques (USSR)
34. Metal Progress (USA)

35. Nuclear News (USA)
36. Optical Engineering (USA)
37. Quality (USA)
38. RCA Review (USA)
39. Review of Scientific Instruments (USA)
40. SAMPE (USA)
41. Science Abstracts, Sections A & B (GB)
42. Ultrasonic Imaging (USA)
43. Wear (Netherlands)
44. Welding Journal (USA)

For each of the items accessioned by NTIAC, a computerized bibliographic record is created. Each such record comprises the pertinent fields, illustrated in Figure 4. Index terms (descriptors) are taken from a controlled word list prepared by NTIAC; this list is updated at least semiannually. In those cases where a bibliographic record already exists in the Technical Report file at DTIC, NTIAC augments the DTIC record by adding the NTIAC accession number and descriptors, thus effectively bringing such records into the NTIAC file.

The current status of NTIAC's bibliographic data file is presented in Table 3.

In addition to its own unique bibliographic data file, NTIAC also has access, through its RDT&E on-line terminal, to DTIC's Technical Report (based on DD Form 1473), the Work Unit File (based on DD Form 1498), and the R&D Program Planning File (based on DD Form 1634).

The on-line system was returned to fulltime operation at the beginning of this contract year. The system enhancements implemented by DTIC included text searching and title searching. The addition of these features has greatly improved the system's capabilities.

In November the modification to the program was completed which allows NTIAC to receive indexes along with bibliographies. Indexes were always available with bibs ordered from the TR file but not from the NTIAC file. This, too, has greatly improved the usefulness of the system.

In January the IAC files became available to all RDT&E users. There has not been a great impact on NTIAC as a result of this change; however, we have received a few requests for assistance with the contents of NTIAC's file.

The annual RDT&E users conference was held October 24-26 in Alexandria. Fran Hicks attended this meeting which was largely devoted to the release of IAC data. Also included were explanations of DDC's name change to DTIC and the expanded mission and objectives of DTIC.

In January NTIAC received all the hard copy documents from the AMMRC collection, approximately 4000 documents. These records have been added to our physical collection and we are updating the information in our data base. When this file maintenance task is complete, the data base and the document collection will be in agreement. This will enable us to receive accurate statistics from the on-line system, for example, totals of hard copy, microfiche, and journal articles contained in our file.

NTIAC plans to request a UNIVAC 786 printer to replace the UNIVAC 800 which we now use. Also, our plans include pursuing the initiation of an IAC user group for interaction with DTIC. The IAC's would benefit from a separate user group since their requirements are different from those of other users. We will continue our efforts to be placed on primary distribution lists to receive reports relative to our mission. We expect to have our profile (search) at DTIC updated within the next few weeks at which time we will take advantage of the Automatic Document Distribution Service which DTIC offers.

NTIAC		LITERATURE REVIEW WORKSHEET		(42) NT-10959 (1) AD-D301672
(6) Title	Nuclear Resonances in Metals			
(10) Authors:	I. D. Weisman, L. J. Swartzendruber, L. H. Bennett			
(122) Availability	Published in Techniques of Metals Research; Vol. 1, Pt. 2; 1973; Chapter 9; 165-504		(33) Code	1, 21
			(43) Copy	1
(21) Sup. Note:	See also NT-8231		(11) Date:	1973
			(12) No. pp:	340
(35) Source Code:	(14) Source Series:			
(15) Contract:	(18) Mon. Acronym:	(19) Mon. Series:		
(9) Descr. Note:	(34) Serial Descr.:			
(30) Annotation:	Authoritative. Advanced discussion.			
(27) Abstract:	<p>A general review of theory, experimental apparatus and technique, and representative results of nuclear resonances in metals. Covers continuous-wave and pulsed NMR, nuclear quadrupole resonance (NQR), NMR in ferromagnetic materials (FMR), the Mossbauer effect, and combined resonances (the Overhauser effect), acoustic modulation of Mossbauer spectra, nuclear magnetic acoustic resonance, helicon waves, and electron-nucleus double resonance. Also discussed are thermal effects, sample size and shape effects, diffusion, spurious resonances, calorimetric detection of NMR, and NMR in superconductors. (NTIAC)</p>			
(44) Descriptors:	<p>*Nuclear magnetic resonance, *Nuclear quadrupole resonance,</p> <p>*Mossbauer effect, test book, reviews, acoustic nuclear resonance</p>			
Other key words:				
			Date Input:	
			Indexer:	

Figure 4

Table 3

Status of the NTIAC Bibliographic Data Base  
15 February 1979 - 15 February 1980

Documents in file	17,546
Complete records	14,152
Partial records	3,394

### C. Current Awareness and Promotional Activities

During 1979 the NTIAC Newsletter circulation exhibited a slow but definite increase: from 4,136 in February, 1979, to 4,229 in February, 1980.

The February 1979 issue was devoted almost entirely to NTIAC's products and services, such as publications on various topics in NDT and on the bibliographic services available.

The March and April issues featured a two-part series on "Minicomputer and Microprocessor Control of Scanners," wherein the computer is "trained" to take over part or all of the scanner control.

The May issue featured an article on "Applications of Ferrography," a relatively new technique for determining ferrous particles and other debris in lubricating oils and other engineering fluids.

The June issue introduced the NTIAC Handbook.

A closer look at sections 2, 5, and 6 of the NTIAC Handbook was given in the July issue. The July issue also carried an article on "Soundness Requirements for Aluminum Castings" wherein reproductions of radiographs plus photographs of cross sections were graded as to compliance with ASTM standards.

The August issue carried an article on "Advanced Techniques for Acoustic Imaging." This article featured a chart (Table 2) compiled by the editor, which compares all the acoustic imaging techniques mentioned in the body of the article.

Featured in the October issue was an article entitled, "Flash Radiography in Ballistic Testing." (In ballistics applications, flash radiography has been used in studies of shaped charges, armor piercing, discarding sabot projectiles, in-bore radiographs of projectiles, and interaction of explosive projectiles with targets.)

The November issue carried an article on another approach to acoustic imaging entitled, "Synthetic Aperture Focusing Technique for Ultrasonic Testing."

The December issue carried an article on the "Laser Scan Inspection of Cannon Tubes."

The January 1980 issue presented an article on "Quantitative NDI for Retirement-for-Cause." This article focused mainly on turbine engine components. (An eddy current technique was used to locate and define cracks in the bolt holes of turbine disks; the crack sizes are quantified as to severity.)

The February 1980 issue carried an article on the "Application of Neutrons in Nondestructive Evaluation."

During the year 32 meeting notices of interest to the NDT community were published as well as four calls for papers.

Table 4

## 1979 Newsletter Circulation

Army	179
Navy	207
Air Force	176
DoD Non-Service	65
Other Government	166
Foreign	167
Foreign Government	53
U.S. Private Sector	<u>3216</u>
TOTAL	4229



Table 5 summarizes NTIAC current awareness participation at promotional briefings and displays at various conferences and meetings during the past year. We have also included a DTIC users conference in this listing, and a DoD IAC Directors meeting.

On March 6, Dr. Smith gave a brief talk on NTIAC operations to twenty industry representatives who visited Southwest Research Institute to learn of Institute NDE capabilities.

Dr. Smith attended a symposium on advanced nondestructive testing techniques, sponsored by Gordon and Breach Science Publishers, Inc. and the University of Illinois, at Chicago Circle, IL, on March 20-22.

On April 2-5, NTIAC sponsored a table top exhibit of products and the Newsletter at the ASNT Spring Conference, held at the Town and Country Hotel, San Diego, CA. This conference and exhibit were very well attended, the registration exceeding all previous spring ASNT conference figures.

NTIAC took an active part in the 12th biennial symposium on nondestructive evaluation, held at San Antonio, TX, during April 24-26. NTIAC personnel were contributors to the organization of this symposium and have prepared the publication of the symposium's proceedings.

Dr. Smith attended the Rockwell/Air Force Quantitative NDE Review held July 9-13 at Scripps Oceanographic Institute in La Jolla, CA.

On July 29-August 3, Dr. Smith attended the Engineering Foundation Conference, "Technical Information-Which Way Is The Future?" Copies of the NTIAC User's Guides were distributed, together with copies of the Newsletter.

On May 21, Science Trends, Vol. XXXXII, No. 5, Publication Checklist, on page 29, gave a brief writeup of the NTIAC state-of-the-art survey on automated radiography.

Dr. Smith attended the International Conference on Acoustic Emission held in Anaheim, CA, on September 10-13.

NTIAC had a display booth, manned by Dr. Smith, at the Fall ASNT Conference held at St. Louis, October 15-19.

On October 29, Science Trends contained an article under their Publication Checklist advertising the NTIAC Handbook.

November 16-23, Dr. Smith attended the World Conference on Nondestructive Evaluation, held at Melbourne, Australia.

Dr. Smith attended the International Conference on NDE for the Nuclear Utility Industry, held at Salt Lake City, UT, February 10-14.

NTIAC continues to receive excellent support from ASNT in the area of publicizing our products. Many of our products are now routinely and continuously carried along with other important ASNT offerings in their advertising.

Table 5

Current Awareness and Promotional Meetings  
For Period 15 February 1979 through 15 February 1980

Symposium on Advanced NDE	19-22 March 1979 Chicago, IL
ASNT Spring Conference and Exhibit	1-5 April 1979 San Diego, CA
AFML/Rockwell Conference	8-13 July 1979 San Diego, CA
Engineering Foundation Conference on "Which Way Is The Future?"	29 July-3 August 1979 Rindge, N H
ASNT International Conference on Acoustic Emission	9-13 September 1979 Anaheim, CA
ASNT Fall Meeting	15-18 October 1979 St. Louis, MO
RDT&E Users Conference (F. Hicks)	24-26 October 1979 Alexandria, VA
Ninth World Conference on NDE	11-24 November 1979 Melbourne, Australia
DoD IAC Directors Meeting	16-17 December 1979 Washington, D C
Third International Conference on NDE for Nuclear Industry	10-14 February 1980 Salt Lake City, UT

During the first quarter of the year, visitors to NTIAC included Dean Max L. Williams of the University of Pittsburgh, Mr. Joseph L. Blue of DLA, Mr. Sam Valencia of AMMRC, and Mr. George Darcy, of AMMRC.

#### D. Inquiries

NTIAC responded to 90 inquiries during this reporting period. Twenty-four bibliographies were delivered at charges of \$3865. Of these, only two were from government agencies. Of the 10 inquiries of a technical nature, one was from a government agency. Also, one government agency was included in the 18 inquiries for service information. Most of the inquiries from government agencies were for assistance in locating reports.

As in past reporting periods, charges continue to be the primary deterrent to greater utilization of NTIAC by government agencies, except for Super Inquiries. Thus, continued growth in this service area depends primarily upon response of the commercial, industrial, and academic user community.

Table 6 summarizes inquiry activity for this period.

#### E. Technical Publications

NTIAC has issued the NTIAC Handbook and a state-of-the-art survey titled, "The Barkhausen Effect and Its Applications to Nondestructive Evaluation." We have also prepared and received approval for a critical review on magnetic leakage methods and a state-of-the-art survey on optical technologies for NDE. Both of these publications are now being printed. During the year a critical review on accreditation and certification has been drafted, and two state-of-the-art surveys on composite materials have been initiated and are nearing completion.

Our publications have been enjoying a good acceptance by the technical community as is shown by the following Table 7.

Table 7

#### 1979 Publication Sales

<u>Publication</u>	<u>Title</u>	<u>Sales</u>
NTIAC-76-1	Electromagnetic Acoustic Transducers	53
NTIAC-76-2	Proceedings of a Workshop on NDE of Residual Stress	17
NTIAC-77-1	Advanced Ultrasonic Testing Systems	89
NTIAC-78-1	Automated Radiography, A State of the Art Survey	87
NTIAC-78-2	Liquid Crystals for Nondestructive Evaluation	29
NTIAC-79-1	NTIAC Handbook	236
NTIAC-79-2	Barkhausen Effect & Its Applications to NDE	23

Table 6

Technical and Bibliographic Inquiries  
15 February 1979 - 15 February 1980

<u>No.</u>	<u>Source</u>	<u>Type</u>	<u>Amt.</u>	<u>Date</u>
0416	The Boeing Wichita Co.	Bibliography	\$ 90	2/27/79
0417	FDA-WEAC	Service Info.	n/c	2/28/79
0418	Gull Airborne Instruments	Tech. Inq.	n/c	3/7/79
0419	Fluor Engineers	Service Info.	n/c	3/16/79
0420	Technical Operations	Service Info.	n/c	3/20/79
0421	IBM	Bibliography	\$145	3/26/79
0422	Metals Society	Information	n/c	3/27/79
0423	Smith Kline	Bibliography	\$ 90	3/27/79
0424	Lenox Instruments	Information	n/c	4/3/79
0425	OCS America	Service Info.	n/c	4/4/79
0426	SwRI	Bibliography	\$120	4/13/79
0427	Booz-Allen & Hamilton	Information	n/c	4/17/79
0428	Boeing Seattle	Service Info.	n/c	4/17/79
0429	SwRI	Service Info.	n/c	4/19/79
0430	Rockwell International	Service Info.	n/c	4/27/79
0431	University of Alabama	Information	n/c	4/28/79
0432	AMMRC	Bibliography	n/c	5/3/79
0433	AMMRC	Information	n/c	5/3/79
0434	SwRI	Bibliography	\$100	5/3/79
0435	ITT Grinnell	Service Info.	n/c	5/4/79
0436	General Dynamics	Service Info.	n/c	5/7/79
0437	SwRI	Bibliography	\$ 90	5/15/79
0438	SwRI	Bibliography	\$ 80	5/29/79
0439	Hughes Aircraft	Service Info.	n/c	5/29/79
0440	KB Aerotech	Bibliography	\$100	6/6/79
0441	SwRI	Bibliography	\$185	6/7/79
0442	Global Publications	Tech. Inq.	n/c	7/17/79
0443	F.L. Smidth & Co.	Tech. Inq.	n/c	7/17/79
0444	Information Handling Service	Service Info.	n/c	7/19/79
0445	Teknekron Res. Inc.	Bibliography	\$100	7/26/79
0446	SubOceanic Consultants	Service Info.	n/c	7/27/79
0447	NASA	Tech. Inq.	n/c	7/27/79
0448	General Dynamics	Bibliography	\$295	8/7/79
0449	AMMRC	Bibliography	n/c	8/13/79
0450	Reinhardt Associates	Bibliography	\$190	8/23/79
0451	Interdevelopment Inc.	Tech. Response	n/c	8/27/79
0452	AMMRC	Info.	n/c	9/6/79
0453	Tarrant County Jr. College	Info.	n/c	9/17/79
0454	Charles Frumberg	Service Info.	n/c	9/19/79
0455	SwRI	Bibliography	\$110	9/19/79
0456	University of Denver	Report Info.	n/c	9/19/79
0457	GATX	Bibliography	\$110	9/27/79
0458	Hanson Materials Engineering	Tech. Response	n/c	9/27/79
0459	Drexel University	Bibliography	\$190	10/16/79
0460	Exxon	Report Info.	n/c	10/16/79
0461	Columbia Gas Transmission	Report Info.	n/c	10/30/79
0462	SwRI	Bibliography	\$120	11/1/79
0463	Mr. Sullivan	Tech. Response	n/c	11/1/79

<u>No.</u>	<u>Source</u>	<u>Type</u>	<u>Amt.</u>	<u>Date</u>
0464	Center for Naval Analyses	Report Info.	n/c	11/5/79
0465	SwRI	Product Info.	n/c	11/7/79
0466	Ivan Ash	Service Info.	n/c	11/7/79
0467	Exxon Nuclear	Report Info.	n/c	11/7/79
0468	Mettek	Service Info.	n/c	11/15/79
0469	J.A. Kumar	Report Info.	n/c	11/15/79
0470	ARMCO	Report Info.	n/c	11/20/79
0471	Richard Marbois WPPSS	Tech. Response	n/c	10/17/79
0472	Millersville College	Tech. Response	n/c	10/11/79
0473	J.A. Jones Construction Co.	Service Info.	n/c	9/21/79
0474	Consolidated Diesel Elec. Co.	Service Info.	n/c	9/5/79
0475	Stanford University	Service Info.	n/c	9/5/79
0476	Taiwan	Info.	n/c	12/3/79
0477	England	Info.	n/c	12/3/79
0478	Naval Weapons Station	Searching for Rpt.	n/c	12/4/79
0479	Nuclear Energy Service	Searching for Rpt.	n/c	12/6/79
0480	Korea	Info.	n/c	12/7/79
0481	SwRI	Bibliography	\$265	12/10/79
0482	Department of Army	Info.	n/c	12/10/79
0483	Nova Scotia Research	Info.	n/c	12/10/79
0484	Ames Research Lab	Info.	n/c	12/13/79
0485	Bendix	Tech. Inq.	n/c	12/13/79
0486	RHP Bearing Res. Center	Info.	n/c	12/13/79
0487	United Engineers	Info.	n/c	12/12/79
0488	Australia	Info.	n/c	12/14/79
0489	SwRI	Bibliography	\$120	12/20/79
0490	Chesterfield Cylinder	Bibliography	\$100	1/2/80
0491	Cognitronics	Info.	n/c	1/2/80
0492	Langley Research	Info.	n/c	1/3/80
0493	RHP Bearing Res. Center	Info. on Report	n/c	1/3/80
0494	Public Service Co. (Colorado)	Info.	n/c	1/2/80
0495	Bethlehem Steel	Info.	n/c	1/4/80
0496	GMC	Info.	n/c	1/14/80
0497	SwRI	Bibliography	\$460	1/15/80
0498	Testing Engineers Inc.	Info.	n/c	1/17/80
0499	University of Houston	Bibliography	\$260	1/22/80
0500	Panametrics	Info.	n/c	1/23/80
0501	SwRI	Info.	n/c	1/25/80
0502	Kubota America Corporation	Info.	n/c	1/30/80
0503	Atomic Energy of Canada	Info.	n/c	2/6/80
0505	SwRI	Bibliography	\$455	2/15/80
0506	SwRI	Bibliography	\$ 90	2/15/80

F. Special Services

During this year, NTIAC has been successful in marketing special tasks totaling an income of \$185,058 (this income is included under "Other" in Form DSAH 1261). These special tasks include the management and operation of the biennial symposia on nondestructive testing held in San Antonio, Texas, and scheduled to be next given in April of 1981, a technology assessment of optical methods for NDE, an analysis of Barkhausen data, an analysis of radiographic data, an analysis of magnetic perturbation data for shells, and an analysis of NMR moisture in composites data.

### III. FUTURE PLANS

A. Current Awareness and Promotional Activities

NTIAC will be represented at the Spring ASNT meeting to be held in Philadelphia, and the Fall General ASNT meeting to be held in Houston. NTIAC will also be active in the preparations for the 13th Symposium on Nondestructive Evaluation to be held in San Antonio in April of 1981. We have made tentative plans to attend the ultrasonic symposium to be sponsored by the National Bureau of Standards and the symposium on the NDE of composites to be sponsored by ASTM. NTIAC also plans to be represented at the Rockwell/Air Force Quantitative NDE Review.

The Newsletter will give more emphasis to NTIAC products and services and will encourage reader response to the Users Forum Section.

B. Products and Services

During the coming year, we shall be updating the NTIAC Handbook and publishing state-of-the-art surveys on the NDE of composites (in two volumes), a state-of-the-art survey on optical methods for NDE, the critical review on accreditation and certification, a critical review on eddy currents, and an additional state-of-the-art survey not yet identified by subject.

We plan to prepare prepackaged bibliographies on selected topics of unusually wide interest and importance to the user community. The first one of these, to be offered at the beginning of the contract year, is concerned with the economics and cost effectiveness of NDE.

## APPENDIX A

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		NAME OF INFORMATION ANALYSIS CENTER Nondestructive Test, Inform. Analysis Center				QUARTER ENDING 15 February 1980		CUMULATIVE THRU	
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME	
		PRO- FESSIONAL	NON-PRO- FESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL		
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		375	276.5	651.5	9439	12,201	21,640		
a. DOCUMENTS ACQUIRED	784								
b. DOCUMENTS REVIEWED	784								
c. DOCUMENTS CATALOGED	725								
2. TECHNICAL INQUIRY RESPONSES PROVIDED	1	2	--	2	23	33	56	11.50	
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	7	72	2	74	372	1213	1585	1048	
4. HANDBOOKS' DATA BOOKS COMPLETED		107	--	107	362	2450	2812	1443	
a. NEW CHAPTERS/PAGES COMPLETED	--								
b. REVISED CHAPTERS/PAGES COMPLETED	--								
c. DATA SETS COMPILED	--								
5. STATE-OF-THE-ART STUDIES COMPLETED	1	91	5	96	2491	4250	6741	620	
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED	--	196.5	196.5	393	4502	6053	10,555	363	
7. CURRENT AWARENESS AND PROMOTION EFFORTS		338	82	420	10,229	9433	19,662	390	
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED	12,597								
b. NUMBER MEETINGS CONFERENCES, ETC SUPPORTED	3								
8. OTHER	--	--	--	--	--	--	--	27,290	
9. MANAGEMENT AND SUPPORT		159	262	421	5109	6307	11,416		
10. UNASSIGNABLE INDIRECT COSTS		--	--	--	--	--	--		
11. TOTAL		1340.5	824	2164.5	32,527	41,940	74,467	31,165.50	



INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT	AREA TITLE	NAME OF INFORMATION ANALYSIS CENTER Nondestructive Testing Inform. Analysis Ctr.				QUARTER ENDING		CUMULATIVE THRU	
		Nondestructive Testing Inform. Analysis Ctr.				15 February 1980		15 February 1980	
		MANHOURS EXPENDED				COSTS INCURRED		INCOME	
	OUTPUT UNITS PRODUCED	PRO- FESSIONAL	NON-PRO- FESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL		
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		2102	1129	3231	33,690	43,614	77,304		
a. DOCUMENTS ACQUIRED	3301								
b. DOCUMENTS REVIEWED	3301								
c. DOCUMENTS CATALOGED	2763								
2. TECHNICAL INQUIRY RESPONSES PROVIDED	10	17	2	19	75	316	391	166	
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	26	172	57	229	239	3330	3569	3972	
4. HANDBOOKS/ DATA BOOKS COMPLETED		421	20	441	1368	9549	10,917	9586	
a. NEW CHAPTERS/ PAGES COMPLETED	215								
b. REVISED CHAPTERS/ PAGES COMPLETED	--								
c. DATA SETS COMPILED	--								
5. STATE-OF-THE-ART STUDIES COMPLETED	1	322	94	416	4419	9327	13,746	3896	
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED	--	293	225.5	518.5	5948	9439	15,387	1445	
7. CURRENT AWARENESS AND PROMOTION EFFORTS		2268	823.5	3091.5	72,664	60,971	133,635	390	
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED	55,249								
b. NUMBER MEETINGS/ CONFERENCES ETC SUPPORTED	12								
8. OTHER	--	--	--	--	--	--	--	185,058	
9. MANAGEMENT AND SUPPORT		688	1000.5	1688.5	21,037	25,185	46,222		
10. UNASSIGNABLE INDIRECT COSTS		--	--	--	--	--	--		
11. TOTAL		6283	3351.5	9634.5	139,440	161,731	301,171	204,513	